Index of Authors

ABI SAID, M. *see* HAMADEH, S. K.

ADU, E. K., BARRY, T. N., WILSON, P. R. and KEMP, P. D. Evaluation of *Lotus corniculatus* for increasing pre-weaning growth of red and hybrid deer, 197

AGRICULTURAL RESEARCH MODELLERS' GROUP, Proceedings of the Thirtieth Meeting of the Agricultural Research Modellers' Group, 237

AHARONI, Y. *see* BROSH, A.

ANDERSON, H. A. *see* HOODA, P. S.

ASH, A. J. and MCIVOR, J. G. Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia, 211

BARBOUR, E. *see* HAMADEH, S. K.

BAREJ, W. *see* PUCHAŁA, R.

BARRY, T. N. The feeding value of chicory (*Cichorium intybus*) for ruminant livestock, 251

BARRY, T. N. *see also* ADU, E. K.

BARTLEY, K. M. *see* FRANCIS, G. S.

BELCHER, S. J. *see* KNOTT, C. M.

BHATTA, R. *see* SHINDE, A. K.

BONVILLANI, A. G., DI RENZO, M. A., MONTILLA, A. and TIRANTI, I. N. β-lactoglobulin variability in Argentinian Holstein cattle, 97

BROSH, A., AHARONI, Y., LEVY, D. and HOLZER, Z. Effects of source and content of ash in poultry litter used in diets for beef cattle, 87

BRUCKENTAL, I. *see* KABABYA, D.

BULDGEN, A. and FRANÇOIS, J. Physiological reactions to imposed water deficit by *Andropogon gayanus* cv. Bisquamulatus and *Cenchrus ciliaris* cv. Biloela in a mixed fodder crop, 31

CABELGUENNE, M. *see* DEBAEKE, P.

CAPESIUS, I. *see* WARPEHA, K. M. F.

CATT, J. A., HOWSE, K. R., CHRISTIAN, D. G., LANE, P. W., HARRIS, G. L. and GOSS, M. J. Strategies to decrease nitrate leaching in the Brimstone Farm Experiment, Oxfordshire, UK, 1988–93: the effect of straw incorporation, 309

CATT, J. A. *see also* LARK, R. M.

CHALMERS, A. G., DYER, C. J. and SYLVESTER-BRADLEY, R. Effects of nitrogen fertilizer on the grain yield and quality of winter oats, 395

CHAMBERS, B. J. and GARWOOD, T. W. D. Lime loss rates from arable and grassland soils, 455

CHRISTIAN, D. G. *see* CATT, J. A.

CLAYTON, C. J. *see* RICHARDS, I. R.

CRIBARI-NETO, F. *see* NEWMAN, J. A.

CRIBB, D. M. *see* WURR, D. C. E.

CUTTLE, S.P., SCURLOCK, R. V. and DAVIES, B. M. S. A 6-year comparison of nitrate leaching from grass/clover and N-fertilized grass pastures grazed by sheep, 39

DAADAA, K. *see* HAMADEH, S. K.

DAVIES, B. M. S. *see* CUTTLE, S.P.

DAWSON, L. E. R. and STEEN, R. W. J. Estimation of maintenance energy requirements of beef cattle and sheep, 477

DEBAEKE, P., CABELGUENNE, M., HILAIRE, A. and RAFFAILLAC, D. Crop management systems for rainfed and irrigated sunflower (*Helianthus annuus*) in south-western France, 171

DI RENZO, M. A. *see* BONVILLANI, A. G.

DYER, C. J. *see* CHALMERS, A. G.

EDMONDSON, R. N. Trojan square and incomplete Trojan square designs for crop research, 135

EDMONDSON, R. N. *see also* WURR, D. C. E.

FAGBOLA, O., OSONUBI, O. and MULONGOY, K. Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system, 79

FELLOWS, J. R. *see* WURR, D. C. E.

FINCK, M. *see* SIELING, K.

FISHWICK, G. *see* HEMINGWAY, R. G.

FOSTER, R., POONI, H. S. and MACKAY, I. J. Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits, 285

FRANCIS, G. S., BARTLEY, K. M. and TABLEY, F. J. The effect of winter cover crop management on nitrate leaching losses and crop growth, 299

FRANÇOIS, J. *see* BULDGEN, A.

FRANKOW-LINDBERG, B. E. and VON FIRCKS, H. A. Population fluctuations in three contrasting white clover cultivars under cutting, with particular reference to overwintering properties, 143

GARWOOD, T. W. D. *see* CHAMBERS, B. J.

GILLILAND, T. J. *see* WARPEHA, K. M. F.

GORDON, F. J. *see* PATTERSON, D. C., YAN, T.

GOSS, M. J. *see* CATT, J. A.

GRALAK, M. *see* PUCHAŁA, R.

HAMADEH, S. K., BARBOUR, E., ABI SAID, M., DAADAA, K. and TARRAF, C. G. Reproductive performance, progesterone serum, and milk production in spring post-partum Awassi and Finn × Texel × Awassi ewes, 347

HAMELEERS, A. and MAYES, R. W. The use of n-alkanes to estimate supplementary grass silage intake in grazing dairy cows, 205

HAND, D. W. *see* WURR, D. C. E.

HANNAH, M. A. *see* WURR, D. C. E.

HANUS, H. *see* SIELING, K.

HARRIS, G. L. *see* CATT, J. A.

HEMINGWAY, R. G., PARKER, E. R., PARKINS, J. J., FISHWICK, G. and RITCHIE, N. S. Bioavailability assessments of granular calcined magnesites derived from magnesite rocks and of magnesium hydroxide powder in sheep, 229
HILAIRE, A. *see* DEBAEKE, P.
HOLZER, Z. *see* BROSH, A.
HONGO, A. Selective grazing in pure leaf and leaf/culm mixtures of herbage grasses by sheep, 353
HOODA, P. S., MOYNAGH, M., SVOBODA, I. F. and ANDERSON, H. A. A comparative study of nitrate leaching from intensively managed monoculture grass and grass–clover pastures, 267
HOWSE, K. R. *see* CATT, J. A.

JENSEN, M. J *see* NEWMAN, J. A.
JONES, R. A. C. and NICHOLAS, D. A. Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture, 155

KABABYA, D., PEREVOLOTSKY, A., BRUCKENTAL, I. and LANDAU, S. Selection of diets by dual-purpose Mamber goats in Mediterranean woodland, 221
KARIM, S. A. *see* SHINDE, A. K.
KEMP, P. D. *see* ADU, E. K.
KIELA, P. *see* PUCHALA, R.
KILPATRICK, D. J. *see* PATTERSON, D. C., YAN, T.
KNOTT, C. M. and BELCHER, S. J. Optimum sowing dates and plant populations for winter peas (*Pisum sativum*), 449
KUMAR, R. *see* SHARMA, S. N.

LANDAU, S. *see* KABABYA, D.
LANE, P. W. *see* CATT, J. A.
LARK, R. M., CATT, J. A. and STAFFORD, J. V. Towards the explanation of within-field variability of yield of winter barley: soil series differences, 409
LEE, K. K. *see* PIARA SINGH, REGO, T. J.
LEŚNIEWSKA, V. *see* PUCHALA, R.
LEVY, D. *see* BROSH, A.
LEWIS, C. E. *see* WISEMAN, J.
LIAKATAS, A. *see* ROUSSOPOULOS, D.
LODGE, G. A. *see* MAHGOUB, O.

MCIVOR, J. G. *see* ASH, A. J.
MACKAY, I. J. *see* FOSTER, R.
MAHGOUB, O. and LODGE, G. A. A comparative study on growth, body composition and carcass tissue distribution in Omani sheep and goats, 329
MARANVILLE, J. W. *see* MASI, C. E. A.
MASI, C. E. A. and MARANVILLE, J. W. Evaluation of sorghum root branching using fractals, 259
MATTHEWS, S. *see* NAYLOR, R. E. L.
MAYES, R. W. *see* HAMELEERS, A.
MONTEITH, J. L. *see* PIARA SINGH, REGO, T. J.
MONTILLA, A. *see* BONVILLANI, A. G.
MOYNAGH, M. *see* HOODA, P. S.
MULONGOY, K. *see* FAGBOLA, O.

NAGESWARA RAO, V. *see* REGO, T. J.
NAYLOR, R. E. L., STOKES, D. T. and MATTHEWS, S. Biomass, shoot uniformity and yield of winter barley, 13
NDUNGURU, B. J. *see* NTARE, B. R.
NEWMAN, J. A., CRIBARI-NETO, F. and JENSEN, M. J The sensitivity of n-alkane analysis to measurement error: implications for use in the study of diet composition, 465
NICHOLAS, D. A. *see* JONES, R. A. C.
NTARE, B. R., WILLIAMS, J. H. and NDUNGURU, B. J. Effects of seasonal variation in temperature and cultivar on yield and yield determination of irrigated groundnut (*Arachis hypogaea*) during the dry season in the Sahel of West Africa, 439

OLASANTAN, F. O. Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*), 293
OSONUBI, O. *see* FAGBOLA, O.

PARKER, E. R. *see* HEMINGWAY, R. G.
PARKINS, J. J. *see* HEMINGWAY, R. G.
PATTERSON, D. C., YAN, T., GORDON, F. J. and KILPATRICK, D. J. Effects of bacterial inoculation of unwilted and wilted grass silages. 2. Intake, performance and eating behaviour by dairy cattle, 113
PATTERSON, D. C. *see also* YAN, T.
PEARCE, S. C. Field experimentation on rough land: the method of Papadakis reconsidered, 1
PEREVOLOTSKY, A. *see* KABABYA, D.
PFEFFER, E. and RODEHUTSCORD, M. Body chemical composition and utilization of dietary energy by male Saanen kids fed either milk to satiation or solid complete feeds with two proportions of straw, 487
PIARA SINGH, MONTEITH, J. L., LEE, K. K., REGO, T. J. and WANI, S. P. Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 2. Biomass and water extraction, 429
PIARA SINGH *see also* REGO, T. J.
POONI, H. S. *see* FOSTER, R.
PUCHALA, R., ZABIELSKI, R., LEŚNIEWSKA, V., GRALAK, M., KIELA, P. and BAREJ, W. Influence of duodenal infusion of betaine or choline on blood metabolites and duodenal electrical activity in Friesian calves, 321

RAFFAILLAC, D. *see* DEBAEKE, P.
REEVE, A. J. K. *see* RICHARDS, I. R.
REGO, T. J., MONTEITH, J. L., PIARA SINGH, LEE, K. K., NAGESWARA RAO, V. and SRIRAMA, Y. V. Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 1. Biomass and light interception, 417
REGO, T. J. *see also* PIARA SINGH
REZVANI MOGHADDAM, P. and WILMAN, D. Cell wall thickness and cell dimensions in plant parts of eight forage species, 59
REZVANI MOGHADDAM, P. *see also* WILMAN, D.
RICHARDS, I. R., CLAYTON, C. J. and REEVE, A. J. K. Effects of long-term fertilizer phosphorus application on soil and crop phosphorus and cadmium contents, 187
RITCHIE, N. S. *see* HEMINGWAY, R. G.
RODEHUTSCORD, M. *see* PFEFFER, E.
ROUSSOPOULOS, D., LIAKATAS, A. and WHITTINGTON, W. J. Cotton responses to different light–temperature regimes, 277

SANKHYAN, S. K. *see* SHINDE, A. K.
SCHRÖDER, H. *see* SIELING, K.
SCURLOCK, R. V. *see* CUTTLE, S. P.

SHARMA, S. N. and KUMAR, R. Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat, 389
SHINDE, A. K., KARIM, S. A., SANKHYAN, S. K. and BHATTA, R. Seasonal changes in physiological responses and energy expenditure of sheep maintained on semi-arid pasture, 341
SIELING, K., SCHRÖDER, H., FINCK, M. and HANUS, H. Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems, 375
SRIRAMA, Y. V. *see* REGO, T. J.
STAFFORD, J. V. *see* LARK, R. M.
STEEN, R. W. J. *see* DAWSON, L. E. R.
STOKES, D. T. *see* NAYLOR, R. E. L.
SVOBODA, I. F. *see* HOODA, P. S.
SYLVESTER-BRADLEY, R. *see* CHALMERS, A. G.

TABLEY, F. J. *see* FRANCIS, G. S.
TARRAF, C. G. *see* HAMADEH, S. K.
TIRANTI, I. N. *see* BONVILLANI, A. G.

VON FIRCKS, H. A. *see* FRANKOW-LINDBERG, B. E.

WANI, S. P. *see* PIARA SINGH
WARPEHA, K. M. F., CAPESIUS, I. and GILLILAND, T. J. Genetic diversity in perennial ryegrass (*Lolium perenne*) evaluated by hybridization with ribosomal DNA: implications for cultivar identification and breeding, 23
WHITTINGTON, W. J. *see* ROUSSOPOULOS, D.
WILLIAMS, J. H. *see* NTARE, B. R.
WILMAN, D. and REZVANI MOGHADDAM, P. Volume, surface area and cellular composition of chewed particles of plant parts of eight forage species and estimated degradation of cell wall, 69
WILMAN, D. and REZVANI MOGHADDAM, P. *In vitro* digestibility and neutral detergent fibre and lignin contents of plant parts of nine forage species, 51
WILMAN, D. *see also* REZVANI MOGHADDAM, P.
WILSON, P. R. *see* ADU, E. K.
WISEMAN, J. and LEWIS, C. E. Influence of dietary energy and nutrient concentration on the growth of body weight and of carcass components of broiler chickens, 361
WURR, D. C. E., HAND, D. W., EDMONDSON, R. N., FELLOWS, J. R., HANNAH, M. A. and CRIBB, D. M. Climate change: a response surface study of the effects of CO_2 and temperature on the growth of beetroot, carrots and onions, 125

YAN, T., PATTERSON, D. C., GORDON, F. J. and KILPATRICK, D. J. Effects of bacterial inoculation of unwilted and wilted grass silages. 1. Rumen microbial activity, silage nutrient degradability and digestibility, 103
YAN, T. *see also* PATTERSON, D. C.

ZABIELSKI, R. *see* PUCHALA, R.

Index of Subjects

Arachis
Effects of seasonal variation in temperature and cultivar on yield and yield determination of irrigated groundnut (*Arachis hypogaea*) during the dry season in the Sahel of West Africa (Ntare *et al.*), 439

Barley
Biomass, shoot uniformity and yield of winter barley (Naylor *et al.*), 13
Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems (Sieling *et al.*), 375
Towards the explanation of within-field variability of yield of winter barley: soil series differences (Lark *et al.*), 409
Body composition
A comparative study on growth, body composition and carcass tissue distribution in Omani sheep and goats (Mahgoub and Lodge), 329
Influence of dietary energy and nutrient concentration on the growth of body weight and of carcass components of broiler chickens (Wiseman and Lewis), 361
Body chemical composition and utilization of dietary energy by male Saanen kids fed either milk to satiation or solid complete feeds with two proportions of straw (Pfeffer and Rodehutscord), 487
Breeding
Genetic diversity in perennial ryegrass (*Lolium perenne*) evaluated by hybridization with ribosomal DNA: implications for cultivar identification and breeding (Warpeha *et al.*), 23
Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits (Foster *et al.*), 285

Carbon dioxide
Climate change: a response surface study of the effects of CO_2 and temperature on the growth of beetroot, carrots and onions (Wurr *et al.*), 125
Cassava, *see Manihot*
Cattle
Effects of source and content of ash in poultry litter used in diets for beef cattle (Brosh *et al.*), 87
β-lactoglobulin variability in Argentinian Holstein cattle (Bonvillani *et al.*), 97
The use of n-alkanes to estimate supplementary grass silage intake in grazing dairy cows (Hameleers and Mayes), 205
Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia (Ash and McIvor), 211
Influence of duodenal infusion of betaine or choline on blood metabolites and duodenal electrical activity in Friesian calves (Puchała *et al.*), 321
Estimation of maintenance energy requirements of beef cattle and sheep (Dawson and Steen), 477
Chicory, *see Cichorium*
Cichorium
The feeding value of chicory (*Cichorium intybus*) for ruminant livestock (Barry), 251
Climate
Climate change: a response surface study of the effects of CO_2 and temperature on the growth of beetroot, carrots and onions (Wurr *et al.*), 125
Cotton, *see Gossypium*
Cover crops
The effect of winter cover crop management on nitrate leaching losses and crop growth (Francis *et al.*), 299
Cowpea, *see Vigna*
Crop husbandry
Crop management systems for rainfed and irrigated sunflower (*Helianthus annuus*) in south-western France (Debaeke *et al.*), 171
Crops
Climate change: a response surface study of the effects of CO_2 and temperature on the growth of beetroot, carrots and onions (Wurr *et al.*), 125
Effects of long-term fertilizer phosphorus application on soil and crop phosphorus and cadmium contents (Richards *et al.*), 187

Deer
Evaluation of *Lotus corniculatus* for increasing pre-weaning growth of red and hybrid deer (Adu *et al.*), 197
Diets
Effects of source and content of ash in poultry litter used in diets for beef cattle (Brosh *et al.*), 87
Effects of bacterial inoculation of unwilted and wilted grass silages. 1. Rumen microbial activity, silage nutrient degradability and digestibility (Yan *et al.*), 103
Effects of bacterial inoculation of unwilted and wilted grass silages. 2. Intake, performance and eating behaviour by dairy cattle (Patterson *et al.*), 113
Evaluation of *Lotus corniculatus* for increasing pre-weaning growth of red and hybrid deer (Adu *et al.*), 197
Selection of diets by dual-purpose Mamber goats in Mediterranean woodland (Kababya *et al.*), 221
Bioavailability assessments of granular calcined magnesites derived from magnesite rocks and of magnesium hydroxide powder in sheep (Hemingway *et al.*), 229
The feeding value of chicory (*Cichorium intybus*) for ruminant livestock (Barry), 251
Influence of dietary energy and nutrient concentration on the growth of body weight and of carcass components of broiler chickens (Wiseman and Lewis), 361

The sensitivity of n-alkane analysis to measurement error: implications for use in the study of diet composition (Newman *et al.*), 465
Body chemical composition and utilization of dietary energy by male Saanen kids fed either milk to satiation or solid complete feeds with two proportions of straw (Pfeffer and Rodehutscord), 487

Digestibility
In vitro digestibility and neutral detergent fibre and lignin contents of plant parts of nine forage species (Wilman and Rezvani Moghaddam), 51
Cell wall thickness and cell dimensions in plant parts of eight forage species (Rezvani Moghaddam and Wilman), 59
Volume, surface area and cellular composition of chewed particles of plant parts of eight forage species and estimated degradation of cell wall (Wilman and Rezvani Moghaddam), 69
Effects of bacterial inoculation of unwilted and wilted grass silages. 1. Rumen microbial activity, silage nutrient degradability and digestibility (Yan *et al.*), 103

Drought
Physiological reactions to imposed water deficit by *Andropogon gayanus* cv. Bisquamulatus and *Cenchrus ciliaris* cv. Biloela in a mixed fodder crop (Buldgen and François), 31
Seasonal changes in physiological responses and energy expenditure of sheep maintained on semi-arid pasture (Shinde *et al.*), 341
Effects of seasonal variation in temperature and cultivar on yield and yield determination of irrigated groundnut (*Arachis hypogaea*) during the dry season in the Sahel of West Africa (Ntare *et al.*), 439

Energy expenditure
Seasonal changes in physiological responses and energy expenditure of sheep maintained on semi-arid pasture (Shinde *et al.*), 341
Estimation of maintenance energy requirements of beef cattle and sheep (Dawson and Steen), 477

Experimental design
Field experimentation on rough land: the method of Papadakis reconsidered (Pearce), 1
Trojan square and incomplete Trojan square designs for crop research (Edmondson), 135

Feed intake
Effects of bacterial inoculation of unwilted and wilted grass silages. 2. Intake, performance and eating behaviour by dairy cattle (Patterson *et al.*), 113
The use of n-alkanes to estimate supplementary grass silage intake in grazing dairy cows (Hameleers and Mayes), 205
Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia (Ash and McIvor), 211

Feeding behaviour
Effects of bacterial inoculation of unwilted and wilted grass silages. 2. Intake, performance and eating behaviour by dairy cattle (Patterson *et al.*), 113

Fodder crops
Physiological reactions to imposed water deficit by *Andropogon gayanus* cv. Bisquamulatus and *Cenchrus ciliaris* cv. Biloela in a mixed fodder crop (Buldgen and François), 31

Forage
In vitro digestibility and neutral detergent fibre and lignin contents of plant parts of nine forage species (Wilman and Rezvani Moghaddam), 51
Cell wall thickness and cell dimensions in plant parts of eight forage species (Rezvani Moghaddam and Wilman), 59
Volume, surface area and cellular composition of chewed particles of plant parts of eight forage species and estimated degradation of cell wall (Wilman and Rezvani Moghaddam), 69
Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia (Ash and McIvor), 211

Fungi
Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system (Fagbola *et al.*), 79

Genetics
Genetic diversity in perennial ryegrass (*Lolium perenne*) evaluated by hybridization with ribosomal DNA: implications for cultivar identification and breeding (Warpeha *et al.*), 23
β-lactoglobulin variability in Argentinian Holstein cattle (Bonvillani *et al.*), 97
Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits (Foster *et al.*), 285

Goats
Selection of diets by dual-purpose Mamber goats in Mediterranean woodland (Kababya *et al.*), 221
A comparative study on growth, body composition and carcass tissue distribution in Omani sheep and goats (Mahgoub and Lodge), 329
Body chemical composition and utilization of dietary energy by male Saanen kids fed either milk to satiation or solid complete feeds with two proportions of straw (Pfeffer and Rodehutscord), 487

Gossypium
Cotton responses to different light–temperature regimes (Roussopoulos *et al.*), 277

Grain quality
Effects of nitrogen fertilizer on the grain yield and quality of winter oats (Chalmers *et al.*), 395

Grain yield
Effects of nitrogen fertilizer on the grain yield and quality of winter oats (Chalmers *et al.*), 395

Grazing
A 6-year comparison of nitrate leaching from grass/clover and N-fertilized grass pastures grazed by sheep (Cuttle *et al.*), 39
Selective grazing in pure leaf and leaf/culm mixtures of herbage grasses by sheep (Hongo), 353

Groundnut, *see Arachis*

Growth rate
Evaluation of *Lotus corniculatus* for increasing pre-weaning growth of red and hybrid deer (Adu *et al.*), 197

A comparative study on growth, body composition and carcass tissue distribution in Omani sheep and goats (Mahgoub and Lodge), 329
Influence of dietary energy and nutrient concentration on the growth of body weight and of carcass components of broiler chickens (Wiseman and Lewis), 361

Helianthus
Crop management systems for rainfed and irrigated sunflower (*Helianthus annuus*) in south-western France (Debaeke *et al.*), 171
Hybrids
Genetic diversity in perennial ryegrass (*Lolium perenne*) evaluated by hybridization with ribosomal DNA: implications for cultivar identification and breeding (Warpeha *et al.*), 23

Intercropping
Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*) (Olasantan), 293
Irrigation
Crop management systems for rainfed and irrigated sunflower (*Helianthus annuus*) in south-western France (Debaeke *et al.*), 171

Lactation
β-lactoglobulin variability in Argentinian Holstein cattle (Bonvillani *et al.*), 97
Legumes
Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture (Jones and Nicholas), 155
Lime
Lime loss rates from arable and grassland soils (Chambers and Garwood), 455
Linseed, *see Linum*
Linum
Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits (Foster *et al.*), 285
Lolium
Genetic diversity in perennial ryegrass (*Lolium perenne*) evaluated by hybridization with ribosomal DNA: implications for cultivar identification and breeding (Warpeha *et al.*), 23
Lotus
Evaluation of *Lotus corniculatus* for increasing pre-weaning growth of red and hybrid deer (Adu *et al.*), 197

Magnesium
Bioavailability assessments of granular calcined magnesites derived from magnesite rocks and of magnesium hydroxide powder in sheep (Hemingway *et al.*), 229
Maize
Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*) (Olasantan), 293
Manihot
Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system (Fagbola *et al.*), 79
Metabolism
Influence of duodenal infusion of betaine or choline on blood metabolites and duodenal electrical activity in Friesian calves (Puchała *et al.*), 321
Seasonal changes in physiological responses and energy expenditure of sheep maintained on semi-arid pasture (Shinde *et al.*), 341
Milk production
Reproductive performance, progesterone serum, and milk production in spring postpartum Awassi and Finn × Texel × Awassi ewes (Hamadeh *et al.*), 347
Mixed pastures
A 6-year comparison of nitrate leaching from grass/clover and N-fertilized grass pastures grazed by sheep (Cuttle *et al.*), 39
Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture (Jones and Nicholas), 155
A comparative study of nitrate leaching from intensively managed monoculture grass and grass–clover pastures (Hooda *et al.*), 267
Models
Proceedings of the Thirtieth Meeting of the Agricultural Research Modellers' Group (Agricultural Research Modellers' Group), 237

Nitrogen
Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems (Sieling *et al.*), 375
Nitrogen fertilizers
Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat (Sharma and Kumar), 389
Effects of nitrogen fertilizer on the grain yield and quality of winter oats (Chalmers *et al.*), 395
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 1. Biomass and light interception (Rego *et al.*), 417
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 2. Biomass and water extraction (Piara Singh *et al.*), 429
Nitrogen leaching
A 6-year comparison of nitrate leaching from grass/clover and N-fertilized grass pastures grazed by sheep (Cuttle *et al.*), 39
A comparative study of nitrate leaching from intensively managed monoculture grass and grass–clover pastures (Hooda *et al.*), 267
The effect of winter cover crop management on nitrate leaching losses and crop growth (Francis *et al.*), 299
Strategies to decrease nitrate leaching in the Brimstone Farm Experiment, Oxfordshire, UK, 1988–93: the effect of straw incorporation (Catt *et al.*), 309
Nutrient absorption
Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system (Fagbola *et al.*), 79

Effects of long-term fertilizer phosphorus application on soil and crop phosphorus and cadmium contents (Richards *et al.*), 187
Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat (Sharma and Kumar), 389

Oats
Effects of nitrogen fertilizer on the grain yield and quality of winter oats (Chalmers *et al.*), 395

Pastures
A 6-year comparison of nitrate leaching from grass/clover and N-fertilized grass pastures grazed by sheep (Cuttle *et al.*), 39
Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture (Jones and Nicholas), 155
Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia (Ash and McIvor), 211
A comparative study of nitrate leaching from intensively managed monoculture grass and grass–clover pastures (Hooda *et al.*), 267
Perennial ryegrass, *see Lolium*
Pests and diseases
Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture (Jones and Nicholas), 155
Phosphorus
Effects of long-term fertilizer phosphorus application on soil and crop phosphorus and cadmium contents (Richards *et al.*), 187
Pisum
Optimum sowing dates and plant populations for winter peas (*Pisum sativum*) (Knott and Belcher), 449
Plant population density
Population fluctuations in three contrasting white clover cultivars under cutting, with particular reference to overwintering properties (Frankow-Lindberg and von Fircks), 143
Optimum sowing dates and plant populations for winter peas (*Pisum sativum*) (Knott and Belcher), 449
Poultry
Influence of dietary energy and nutrient concentration on the growth of body weight and of carcass components of broiler chickens (Wiseman and Lewis), 361

Radiation
Cotton responses to different light–temperature regimes (Roussopoulos *et al.*), 277
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 1. Biomass and light interception (Rego *et al.*), 417
Reproduction
Reproductive performance, progesterone serum, and milk production in spring postpartum Awassi and Finn × Texel × Awassi ewes (Hamadeh *et al.*), 347
Roots
Evaluation of sorghum root branching using fractals (Masi and Maranville), 259
Rumen micro-organisms
Effects of bacterial inoculation of unwilted and wilted grass silages. 1. Rumen microbial activity, silage nutrient degradability and digestibility (Yan *et al.*), 103
Ruminants
The feeding value of chicory (*Cichorium intybus*) for ruminant livestock (Barry), 251
Ryegrass, *see Lolium*

Sequential cropping
Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*) (Olasantan), 293
The effect of winter cover crop management on nitrate leaching losses and crop growth (Francis *et al.*), 299
Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems (Sieling *et al.*), 375
Sheep
Bioavailability assessments of granular calcined magnesites derived from magnesite rocks and of magnesium hydroxide powder in sheep (Hemingway *et al.*), 229
A comparative study on growth, body composition and carcass tissue distribution in Omani sheep and goats (Mahgoub and Lodge), 329
Seasonal changes in physiological responses and energy expenditure of sheep maintained on semi-arid pasture (Shinde *et al.*), 341
Reproductive performance, progesterone serum, and milk production in spring postpartum Awassi and Finn × Texel × Awassi ewes (Hamadeh *et al.*), 347
Selective grazing in pure leaf and leaf/culm mixtures of herbage grasses by sheep (Hongo), 353
Estimation of maintenance energy requirements of beef cattle and sheep (Dawson and Steen), 477
Silage
Effects of bacterial inoculation of unwilted and wilted grass silages. 1. Rumen microbial activity, silage nutrient degradability and digestibility (Yan *et al.*), 103
Effects of bacterial inoculation of unwilted and wilted grass silages. 2. Intake, performance and eating behaviour by dairy cattle (Patterson *et al.*), 113
The use of n-alkanes to estimate supplementary grass silage intake in grazing dairy cows (Hameleers and Mayes), 205
Soils
Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system (Fagbola *et al.*), 79
Effects of long-term fertilizer phosphorus application on soil and crop phosphorus and cadmium contents (Richards *et al.*), 187
Strategies to decrease nitrate leaching in the Brimstone Farm Experiment, Oxfordshire, UK, 1988–93: the effect of straw incorporation (Catt *et al.*), 309
Towards the explanation of within-field variability of yield of winter barley: soil series differences (Lark *et al.*), 409

Lime loss rates from arable and grassland soils (Chambers and Garwood), 455

Sorghum
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 1. Biomass and light interception (Rego *et al.*), 417
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 2. Biomass and water extraction (Piara Singh *et al.*), 429

Sowing date
Optimum sowing dates and plant populations for winter peas (*Pisum sativum*) (Knott and Belcher), 449

Statistical analyses
Trojan square and incomplete Trojan square designs for crop research (Edmondson), 135
Evaluation of sorghum root branching using fractals (Masi and Maranville), 259
Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits (Foster *et al.*), 285
Towards the explanation of within-field variability of yield of winter barley: soil series differences (Lark *et al.*), 409
The sensitivity of n-alkane analysis to measurement error: implications for use in the study of diet composition (Newman *et al.*), 465

Statistical analysis
Field experimentation on rough land: the method of Papadakis reconsidered (Pearce), 1

Stocking density
Forage quality and feed intake responses of cattle to improved pastures, tree killing and stocking rate in open eucalypt woodlands of north-eastern Australia (Ash and McIvor), 211

Straw
Strategies to decrease nitrate leaching in the Brimstone Farm Experiment, Oxfordshire, UK, 1988–93: the effect of straw incorporation (Catt *et al.*), 309
Body chemical composition and utilization of dietary energy by male Saanen kids fed either milk to satiation or solid complete feeds with two proportions of straw (Pfeffer and Rodehutscord), 487

Sunflower, *see Helianthus*

Techniques
The use of n-alkanes to estimate supplementary grass silage intake in grazing dairy cows (Hameleers and Mayes), 205
Evaluation of sorghum root branching using fractals (Masi and Maranville), 259
Quantitative analysis of *Linum usitatissimum* crosses for dual-purpose traits (Foster *et al.*), 285
Influence of duodenal infusion of betaine or choline on blood metabolites and duodenal electrical activity in Friesian calves (Puchała *et al.*), 321
Selective grazing in pure leaf and leaf/culm mixtures of herbage grasses by sheep (Hongo), 353
Towards the explanation of within-field variability of yield of winter barley: soil series differences (Lark *et al.*), 409
The sensitivity of n-alkane analysis to measurement error: implications for use in the study of diet composition (Newman *et al.*), 465
Estimation of maintenance energy requirements of beef cattle and sheep (Dawson and Steen), 477

Temperature
Climate change: a response surface study of the effects of CO_2 and temperature on the growth of beetroot, carrots and onions (Wurr *et al.*), 125
Population fluctuations in three contrasting white clover cultivars under cutting, with particular reference to overwintering properties (Frankow-Lindberg and von Fircks), 143
Cotton responses to different light–temperature regimes (Roussopoulos *et al.*), 277
Effects of seasonal variation in temperature and cultivar on yield and yield determination of irrigated groundnut (*Arachis hypogaea*) during the dry season in the Sahel of West Africa (Ntare *et al.*), 439

Trifolium
Population fluctuations in three contrasting white clover cultivars under cutting, with particular reference to overwintering properties (Frankow-Lindberg and von Fircks), 143

Urea
Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat (Sharma and Kumar), 389

Vigna
Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*) (Olasantan), 293

Viruses
Impact of an insidious virus disease in the legume component on the species balance within self-regenerating annual pasture (Jones and Nicholas), 155

Water relations
Physiological reactions to imposed water deficit by *Andropogon gayanus* cv. Bisquamulatus and *Cenchrus ciliaris* cv. Biloela in a mixed fodder crop (Buldgen and François), 31
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 1. Biomass and light interception (Rego *et al.*), 417
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 2. Biomass and water extraction (Piara Singh *et al.*), 429

Water use
Response to fertilizer nitrogen and water of post-rainy season sorghum on a Vertisol. 2. Biomass and water extraction (Piara Singh *et al.*), 429

Wheat
Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems (Sieling *et al.*), 375
Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat (Sharma and Kumar), 389

White clover, *see Trifolium*

Yields
Biomass, shoot uniformity and yield of winter barley (Naylor *et al.*), 13
Contribution of arbuscular mycorrhizal (AM) fungi and hedgerow trees to the yield and nutrient uptake of cassava in an alley-cropping system (Fagbola *et al.*), 79
Effects of preceding maize (*Zea mays*) and cowpea (*Vigna unguiculata*) in sole cropping and intercropping on growth, yield and nitrogen requirement of okra (*Abelmoschus esculentus*) (Olasantan), 293
The effect of winter cover crop management on nitrate leaching losses and crop growth (Francis *et al.*), 299
Yield, N uptake, and apparent N-use efficiency of winter wheat and winter barley grown in different cropping systems (Sieling *et al.*), 375
Effects of dicyandiamide (DCD) blended with urea on growth, yield and nutrient uptake of wheat (Sharma and Kumar), 389
Effects of seasonal variation in temperature and cultivar on yield and yield determination of irrigated groundnut (*Arachis hypogaea*) during the dry season in the Sahel of West Africa (Ntare *et al.*), 439